Section 3 Setting to Work

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1. INTRODUCTION

The Operating System (OS), Application Software (AS), and license file are factory installed. For Software installation see Release Bulletin, if required.

2. POWER ON

Desktop:

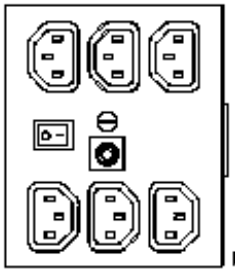

Figure 1 - Internal Furniture: power distribution box

Figure 2 - Internal Furniture: power distribution box

Desktop Version:
Switch on the complete system by pressing the switch on the mains distribution box. The light on the mains switch box is always on when power is applied to it. If the light is off probably the fuse is burnt out.
If the computer does not start, check if the mains switch on the SUN SPARCstation is in the ON position.

Furniture Version:
Switch on the complete system by pressing the power switch on the cabinet.

Now apply power to the system.

- Switch on the SUN SPARCstation
- Switch on the Peripheral Enclosure.
- Switch on the Monitor.

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2.1. POWER ON SELF TEST AND OPENBOOT PROM PHASES

NOTE

After powering on the system (black screen), it takes between 10 and 30 before the memory is tested.

After power on the factory-defined Power On Self Test (POST) phase and the OpenBoot PROM phase are performed automatically (see chapter "Sun Troubleshooting Overview", paragraphs "Factory Defined Boot Mode" and "After Power Is Switched On").

POST phase:
During the POST phase the blinking Caps Lock LED on the keyboard will tell you the POST is in progress. At successful completion of the POST phase the OpenBoot PROM firmware takes control.
OpenBoot PROM phase
During the OpenBoot PROM phase (high level POST) you will first see the EasyVision logo (an Eye) and then "Testing Memory" on the screen. If the OpenBoot PROM phase passes error free the system will boot automatically. If an error occurs, a message on the screen will appear telling you which unit failed.

Now the system should boot, as the SunOS and Application Software has already been loaded at the factory.

2.2. START-UP MENU

After boot up the system will display the Start- up Menu (see below). If no selection (number + CR) is made within 10sec, automatically the Application will be started!

```
1. Start Application
2. Start Customizing
3. Go to Service Menu
4. Go to Installation/Configuration Menu

0. Shutdown
```

Press selection 4, see Release Bulletin

3. CONFIGURATION / CUSTOMIZATION

- Concerning the configuration refer to the Release Bulletin EasyVision RAD Release 4.2.V2 configuration
- Concerning the Customization refer to the EasyVision RAD Operators manual.

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4. POWER OFF

4.1. POWER-OFF IN APPLICATION MODE

NOTE

Client/Server environment: If you turn the Easyserver off, the database is no longer accessible for the clients.

Before switching off the power to the system, exit the clinical application as follows:

1. Click the left mouse button on the upper-left icon on the screen (packet switch icon).
2. Click the left mouse button on the upper-left icon on the 'packet switch' pop-up (logout icon).
3. Release the mouse button.
4. Answer the question: Do you really want to exit the application? by clicking with the left mouse button on confirm
5. The system will then return to the start-up menu. Select 0 (Shutdown) and the system automatically shuts down. After it has completed the shutdown, indicated by showing the ok prompt, you can switch the power off.

4.2. POWER-OFF IN SERVICE MODE

Before switching off the power to the system, always exit from the service mode via the 'Logout' entry in the service menu so that the system can return to the start-up menu. Then select the 'Shutdown' entry and the system will then automatically shut down. After it has completed the shutdown, indicated by showing the ok prompt, you can switch the power off.

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4.3. WHEN THE SYSTEM DOES NOT RESPOND NORMALLY

To halt a system that is hung, or frozen, and unresponsive to commands:

1	Press Stop-A.

NOTE

If the system does not respond to the mouse and keyboard, pressing Stop-A will not be effective. You may have to switch the power off, wait at least 10 seconds, and switch the power back on again. Then try pressing Stop-A once more.

2	When the ok prompt appears, boot the operating system. Enter boot at the ok prompt.

3	The 'Start-Up' menu will be displayed. Enter the number of your choice (See "Start-Up Menu").

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5. MONITOR ADJUSTMENT

The brightness and contrast settings are not factory set. The settings must be adjusted. The adjustment procedure pre-condition is that the monitor is switched on for at least 30 minutes (no screensave operation) before you make any changes:

NOTE

When you configured EasyVision you should have selected "Normal" for the Monitor correction. (see Release Bulletin chapter: EasyVision Configuration). The other selections (Dark and Bright) are only necessary if this procedure does not give the correct results.

- Start the Application software by:
  - switching on the system (automatic start-up) **or**
  - selecting "Start Application" in the Start-up Menu.
- When the application is started cancel "Pictorial Select" window.
- Click "Package Switch" and select "Database Handling".
  In "Database Handling" click "Tools" icon (at right hand top). The pop-up menu “Service functions” appears, select “Test Images”. The pop-up menu “Test Images” appears, select "Load" Printer test images. The Test Images are loaded from a protected area into the local database.
  This way after deletion of the Test images from the local database the Test images can always be reloaded.
- Click "Package Switch" and select "Stack View". The "Pictorial Select" window is shown, select "Test image Printer Calibration" and double click it. Viewing is started, displaying the selected image.
- Select the one-on-one display format.
- Turn the contrast of the monitor to MAX.
  Adjust the brightness so that the 100% white area has a measured output according to the monitor unit manual (see Monitor unit manual Chapter 3: Setting to work).

Should two monitors be placed next to each other this adjustment may be required. Pay particular attention to the fact that brightness perception may differ, depending on your position with respect to the monitor. You must sit in the central position to verify if you have equal brightness. If you sit in front of the right monitor the left appears to be less bright, and when you sit in front of the left monitor the right appears to be less bright.

Follow the procedure described above to adjust both monitors equally.

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6. HARD COPY UNIT (HCU) CALIBRATION

6.1. INTRODUCTION

What is the HCU calibration used for ?

The HCU calibration is necessary to establish a correction (curve) between the EasyVision RAD and a printer (HCU). This correction adapts the EasyVision printing chracteristics to individual deviations of the printer chracteristics such as laser power adjustment, film chracteristics, developer chemistry or temperature etc.

The HCU calibration will be done in two major steps:

1. The density calibration (Gamma Correction) with two substeps:
   - the HCU calibration
   - the verification of the HCU calibration
2. The pixel size calibration

Important: Both the density calibration and pixel calibration have to be carried out for any media of all printers connected.

6.1.1. PRECONDITIONS

After the complete software has been installed on the EasyVision and the system has been configured and customized, the correct density calibration (gamma correction curve) and the pixel size calibration must be carried out on the EasyVision.

Before you do so make sure that the following steps have been carried out:

- The hard copy unit is setup properly with respect to its configuration (this has to be done by the printer manufacturers service engineer)
- The printers self-calibration has been checked or corrected (manufacturers service engineer or Hospital personnel)
- The densitometer has been calibrated and is operating correctly (Philips service personnel)

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6.2. HCU DENSITY CALIBRATION (GAMMA CORRECTION)

6.2.1. DELETING AND LOADING OF THE TESTIMAGES

In order to only use the Testimage PrinterCalibration in its original unmodified condition all testimages must be deleted and then loaded again.

If the application is not running

Start the application :

- from the ok prompt with the command: ok **boot** <Enter>

  (the EasyVision will automatically start the application)

- from the Start up Menu select: **1 Start Application**

If the application is running:

Switch from the **PCR** application screen to the **Data handling facility**;

- click on the door handle icon and on the data handling icon
- Highlight all Testimage objects in the patient list
-

6.2.1.1. Deleting the Testimages

If the **Testimage...**. objects are not visible scroll the patient list with the scrollbar up or down until the **Testimages** appear (default 23 objects);

if the **Testimages** are not listed at all continue with 6.2.1.2 Loading the Testimages.

- Highlight all listed Testimage... entries:

  → position the cursor on the uppermost **Testimage...** and drag the cursor with the left mouse button pressed down to the last **Testimage...** object; (Refer to Figure 3)

- Click on the button Delete and confirm; the Testimage objects will disappear from the patient list

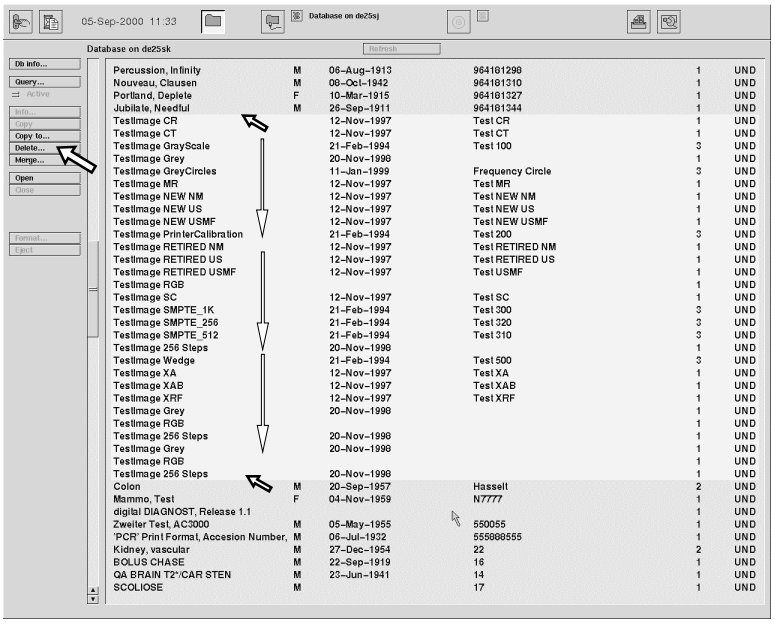
05-Sep-2000 11:33
Database on de25sj
Database on de25sk
Refresh
Db Info...
Query...
Active
Info...
Copy...
Copy to...
Delete...
Merge...
Open
Close
Format...
Eject
Percussion, Infinity M 06-Aug-1913 964181298 1 UND
Nouveau, Clausen M 08-Oct-1942 964181310 1 UND
Portland, Deplete F 10-Mar-1915 964181327 1 UND
Jubilate, Needful M 26-Sep-1911 964181344 1 UND
TestImage CR 12-Nov-1997 Test CR 1 UND
TestImage CT 12-Nov-1997 Test CT 1 UND
TestImage GrayScale 21-Feb-1994 Test 100 3 UND
TestImage Grey 20-Nov-1998 1 UND
TestImage GreyCircles 11-Jan-1999 Frequency Circle 3 UND
TestImage MR 12-Nov-1997 Test MR 1 UND
TestImage NEW NM 12-Nov-1997 Test NEW NM 1 UND
TestImage NEW US 12-Nov-1997 Test NEW US 1 UND
TestImage NEW USMF 12-Nov-1997 Test NEW USMF 1 UND
TestImage PrinterCalibration 21-Feb-1994 Test 200 3 UND
TestImage RETIRED NM 12-Nov-1997 Test RETIRED NM 1 UND
TestImage RETIRED US 12-Nov-1997 Test RETIRED US 1 UND
TestImage RETIRED USMF 12-Nov-1997 Test USMF 1 UND
TestImage RGB 1 UND
TestImage SC 12-Nov-1997 Test SC 1 UND
TestImage SMPTE_1K 21-Feb-1994 Test 300 3 UND
TestImage SMPTE_256 21-Feb-1994 Test 320 3 UND
TestImage SMPTE_512 21-Feb-1994 Test 310 3 UND
TestImage 256 Steps 20-Nov-1998 1 UND
TestImage Wedge 21-Feb-1994 Test 500 3 UND
TestImage XA 12-Nov-1997 Test XA 1 UND
TestImage XAB 12-Nov-1997 Test XAB 1 UND
TestImage XRF 12-Nov-1997 Test XRF 1 UND
TestImage Grey 20-Nov-1998 1 UND
TestImage RGB 1 UND
TestImage 256 Steps 20-Nov-1998 1 UND
TestImage Grey 20-Nov-1998 1 UND
TestImage RGB 1 UND
TestImage 256 Steps 20-Nov-1998 1 UND
Colon M 20-Sep-1957 Hasselt 2 UND
Mammo, Test F 04-Nov-1959 N7777 1 UND
digital DIAGNOST, Release 1.1 1 UND
Zweiter Test, AC3000 M 05-May-1955 550055 1 UND
'PCR' Print Format, Accesion Number, M 06-Jul-1932 555888555 1 UND
Kidney, vascular M 27-Dec-1954 22 2 UND
BOLUS CHASE M 22-Sep-1919 16 1 UND
QA BRAIN T2^/CAR STEN M 23-Jun-1941 14 1 UND
SCOLIOSE M 17 1 UND

Figure 3: Datahandling Screen

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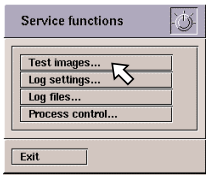
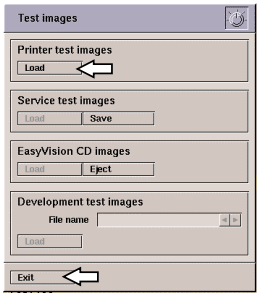
6.2.1.2.Loading the Testimages:

- Click on the tool icon on the tool bar on the top right of the screen.
- In the small panel **Service Functions** popping up click on Testimages



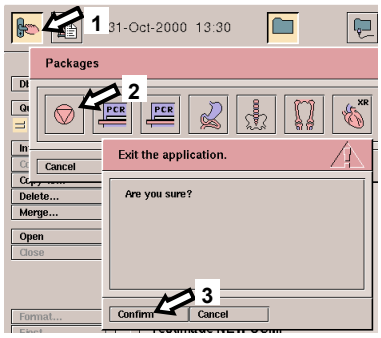
- In the panel Testimages click on the button Load in the area **Printer test images**; the testimages will be loaded on the image database. It will take some seconds for the 23 Testimages to sequencially appear on the image list. Click on Exit.



6.2.2. THE DENSITY CALIBRATION (GAMMA CORRECTION) PROCEDURE

Exit the application until the **Startup menu** will be displayed.

- Click on the door handle ① on the Exit icon ② and confirm ③ in sequence



The EasyVision RAD Startup Menu will be displayed:

EASYVISION STARTUP MENU

What do you want to do?:

1 Start Application
2 Start Customization
→ **3 Go to Service Menu**
4 Go to Installation/Configuration Menu

0 Shutdown

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- Select **3 Service Menu** from the Start-up Menu and enter the password
  The Service Menu will be displayed:

  Service Menu

  1. Diagnostics Menu (sunvts and product diagnostics)
  2. Sun Os Menu (optical disk format and Sun Os commands)
  3. File Menu (file transfer and manipulation commands)
  → **4. Printer Menu (printer tests)**
  5. Monitor Menu (Monitor test images and adjustment)
  6. PCR Systems (PCR diagnostics menu)

  0 Logout

  Enter the number of your choice:

- Select **4 Printer Menu** the printer menu will be displayed

  Printer Menu

  → **1 HCU Calibration (start hardcopy unit calibration)**
  2 Start Printer Status Request
  3 Start Data Channel Printer Test
  Data is sent to the HCU via the data channel, then
  press print on the HCU control panel for output
  4 Start Printer Test
  5 Start S-bus/PCI Printer Visual Interface Test (Led board required)

  0 Return to Service Menu

- Select **1 HCU Calibration**.
  The Hard Copy Unit start screen with the icon bar will be displayed. Gamma correction calibration and pixel size calibration will be performed in sequence.

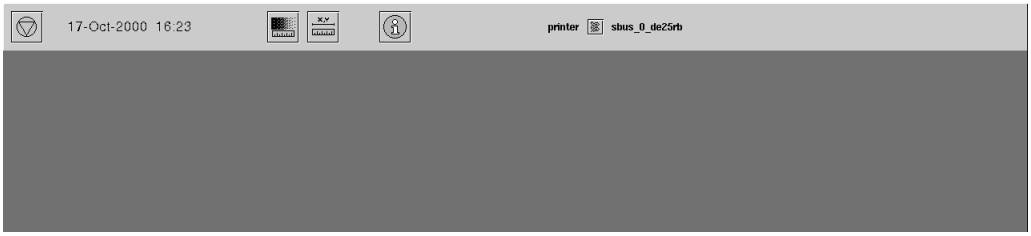
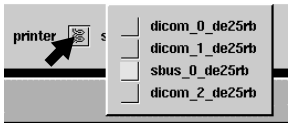


Figure 4: HCU Calibration start screen

6.2.3. HARD COPY GAMMA CORRECTION

The HCU Gamma correction and pixel correction must be carried out for all configured printers and film sizes (Media)

- Click with the right mouse button on the **printer** select spiral icon on the icon bar and select the printer you want to calibrate.



Note: The printer identification strings such as **dicom_0_de25rb** in the example above tells you that this is the **DICOM printer No. 0** (the first) connected to the EasyVision RAD with the IP node name **de25rb**. The relation about which identification string belongs to which physical printer must be taken from the file /easydata/**configuredPrinters.dat** at the EasyVision RAD with the node name de_25rb (in this example).

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- Click on the Hard Copy Gamma Correction icon on the icon bar.
  The Hard Copy Gamma Correction screen will be displayed.
  (refer to Figure 5: Hard Copy Gamma Correction screen)
-

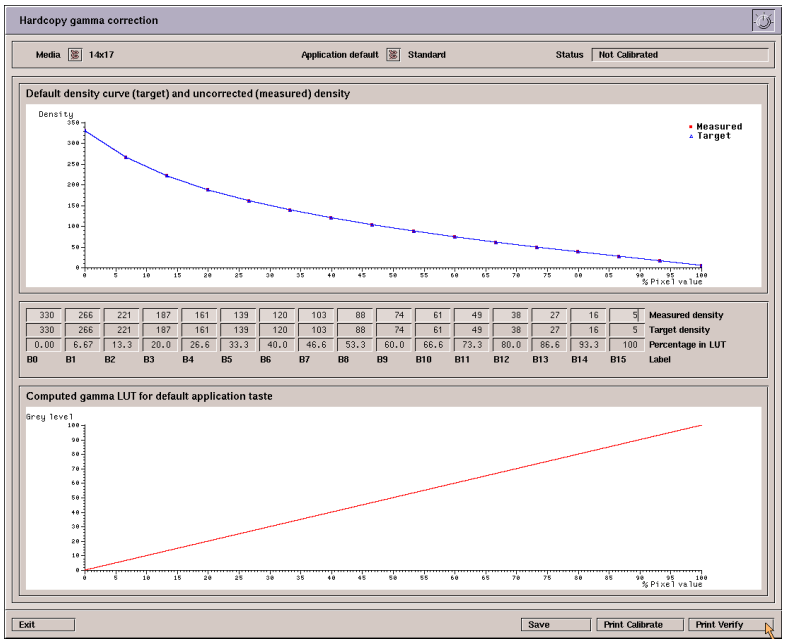
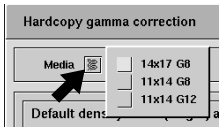

Hardcopy gamma correction
Media 14x17
Application default Standard
Status Not Calibrated
Default density curve (target) and uncorrected (measured) density
Density
Measured
Target
% Pixel value
330 266 221 187 161 139 120 103 88 74 61 49 38 27 16 5 Measured density
330 266 221 187 161 139 120 103 88 74 61 49 38 27 16 5 Target density
0.00 6.67 13.3 20.0 26.6 33.3 40.0 46.6 53.3 60.0 66.6 73.3 80.0 86.6 93.3 100 Percentage in LUT
B0 B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12 B13 B14 B15 Label
Computed gamma LUT for default application taste
Grey level
% Pixel value
Exit
Save
Print Calibrate
Print Verify

Figure 5: Hard Copy Gamma Correction screen

- Click with the right mouse button on the spiral icon **Media** on the top left of the screen and select the media in the Hard Copy Unit you want to calibrate now.



- Click on the button Print Calibrate. The Print Preview panel appears and displays a 2 by 2 array of the PrinterCalibration image in the Print Calibration panel.

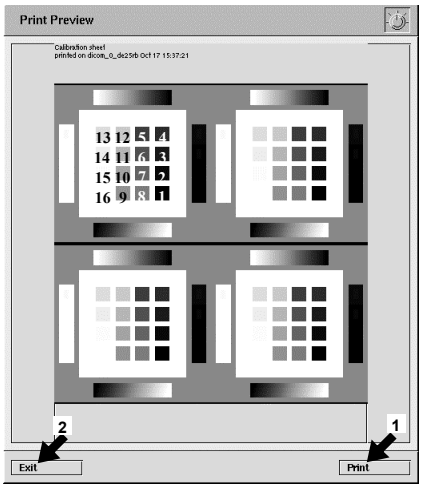


Figure 6: The Calibration Print Preview panel

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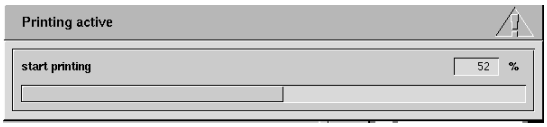
- Click on Print ① on the Print Preview panel.
  The Printing Active panel will be displayed.
  Wait until the Printing Active panel disappears to indicate that printing is complete.



- Click on the button Exit ② of the Print Preview panel to terminate the Print Preview panel. The panel disappears; (don't care if the print Preview panel vanishes without the command Exit)

When the 'Test Print' is ready:

(for standard accuracy)

- Measure the density values of the 16 grey squares of the upper left array on the film. Start with the darkest grey level: No.**1**; *(Calibrate the densitometer first!)*, (for numbering refer to Figure 6: The Calibration Print Preview panel upper left array)

  → *The maximum density must be between 2.9 and 3.1 optical density..*

- Fill in all measured density numbers in the **EasyVision RAD / Imager Calibration form** at the end of this chapter. Fill in the density numbers of the 16 grey levels (start with the darkest grey level: **1**,) in the column **average** of the table **EasyVision RAD Calibration**.

- Now enter the same 16 values in the row **'Measured density'** in the Hard Copy Gamma Correction screen using the TAB key to always select the nearest field on the right.
  → continue with How to proceed

(for higher accuracy)

- Measure the density of the 16 grey squares in all 4 arrays. Start with the darkest grey level: No.**1** (Calibrate the densitometer first!)

  →It is **important** to measure **all** 4 arrays (4 times 16 density values = 64 density values). This is necessary because of the tolerances between the darkest and the lightest areas on the film.
  The maximum density must be between 2.9 and 3.1 optical density;

- Fill in all measured density numbers in the **EasyVision RAD / Imager Calibration Form** at the end of this chapter. Start with the table **EasyVision RAD calibration** and fill in the 16 density numbers of an array of 16 squares in one column e.g. upper left upper right etc. (Don't use the original form make copies of it for spare).

  →The result will be all 4 density numbers of all matching grey levels in one row.

- Take the 4 readings belonging to one grey level (1 row) calculate the average and enter the result in the column **average** of that grey level. Repeat this for all 16 grey levels.

- Enter the 16 averages in the row **'Measured density'** in the **Hard Copy Gamma Correction** screen on the EasyVision; use the TAB key to always select the nearest field on the right

  → *You may correct wrong entries as follows:*

  - *Put the cursor just behind the wrong entry.*
  - *Press left mouse button (an "|" appears).*
  - *Delete entry using DEL key on keyboard.*
  - *Enter new value.*

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How to proceed

- Check whether for **Application default** → **Standard** has been selected.
  Note : on the EasyVision RAD **Standard** is mandatory.

- Click on Save. The Calibration **Save** panel will be displayed.

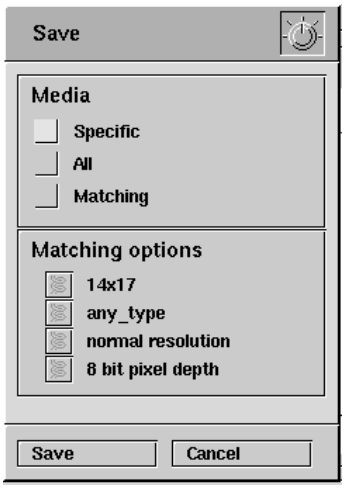


Figure 7: Calibration Save Panel

- Select from the box **Media** in the **Save** panel:

  Specific; only that media type will be calibrated which is displayed under **Media** at the top left of the Hard Copy Gamma Correction panel;

→ **Note**: it is strongly recommended to always select **Specific**

  All in which the calibration is valid for all media types for the printer selected

  Matching in which the calibration is valid for all media of the same size of the printer selected

- Click on Save in the save panel.

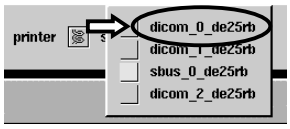
- Click on Exit to terminate the Hard Copy Gamma Correction.

6.2.4. VERIFICATION OF THE DENSITY CALIBRATION

Checking the results of the Hard Copy calibration proceed follows:

→ Make sure that the same printer has been selected as in the calibration procedure.

- Click with the right mouse button on the **printer** select spiral icon on the icon bar and select the printer you want to check.



Note: The printer identification strings such as **dicom_0_de25rb** in the example above tells you: this is the **DICOM printer No. 0** (the first) connected to the EasyVision RAD with the IP node name **de25rb**. The relation about which identification string belongs to which physical printer must be taken from the file /easydata/**configuredPrinters.dat** at the EasyVision RAD.

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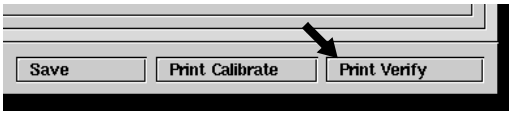
- Click on Print Verify. The Print Verify will print the Printer calibration film in a 2 by 2 array now in that way as a film will be printed by the application.



- Click on Print in the Print Preview panel. The printing active panel will be displayed and the verification film will be printed.

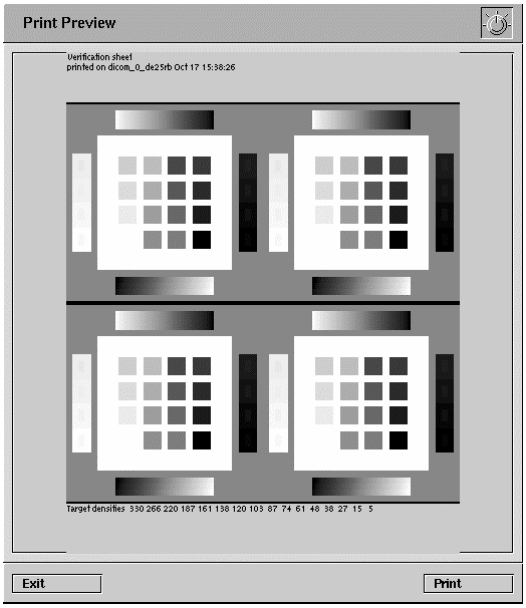

Print Preview
Verification sheet
printed on dicom_0_de25rb Oct 17 15:38:26
Target densities 330 266 220 187 161 138 120 103 87 74 61 48 38 27 15 5
Exit
Print

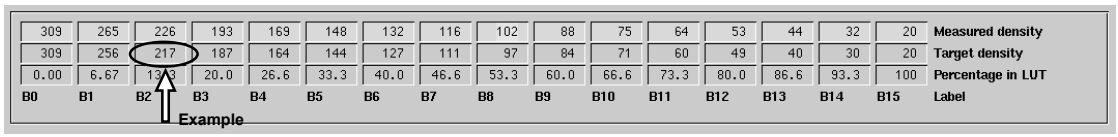
Figure 8: Verification Print Preview Screen

Click on the button Exit to dismiss the Verification Print Preview Screen.

Perform the measurement on the verification film as described in chapter 6.2.3. (first recheck the calibration of the densitometer!). Enter the numbers in the **EasyVision RAD calibration form** table: **EasyVision RAD Calibration Verification**;

- Enter the measured density values in the column average of the **EasyVision RAD Calibration Verification form**

- Transfer the density numbers of the row Target density from the Hard Copy Gamma Correction screen to the column **Target density** of the **EasyVision RAD Calibration Verification form.**



Note: At this point the density calibration procedure ends.
Do not try to enter again the readings of the verification film in the Gamma correction tool
This will end up in a situation of miscalibration

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6.2.5. CALCULATING THE DIVERGENCES

For any grey level the measured density (D_M) value should be **within 5%** of the Target density (D_T**)** plus an offset of 0.02:

$$D_{M\ var} = \text{Measured density} \pm (5\%\ D_T + 0.02).$$

Example:

The Measured density D_M is 226 (= 2.26 optical density).
The Target density D_T is 217 (= 2.17 optical density)

The range of tolerance for D_M: $= 2.17 \pm$ **(5%** D_T **+ 0.02)**

5% of 2.17 = 0.05 x 2.17 = 0.1085

$= 2.17 \pm (0.1085 + 0.02)$

$= 2.17 \pm 0.1285$

The maximum value of D_M $= 2.17 + 0.1285 = 2.2985 \approx$ **2.30**

The minimum value of D_M $= 2.17 - 0.1285 = 2.0415 \approx$ **2.04**

Result: the measured density belonging to the target density 2.17 may vary from **2.04** to **2.30**

→The measured density of 2.26 is within the limits of this grey level.

If any of the density values is not within the limits perform one or more of the following steps:

- Have the printers own calibration rechecked (hospital personnel)
- Verify that your densitometer is operating correctly (densitometer calibration!)
- Check again the current calibration; check the current values for incorrect entries and/or incorrect calculations

6.3. PIXEL SIZE CALIBRATION

- Make sure that the same printer has been selected as in density calibration.
- Click on the Hard Copy Pixel Size icon.
  The **Hard Copy pixel size calibration** panel will be displayed. (Figure 8)

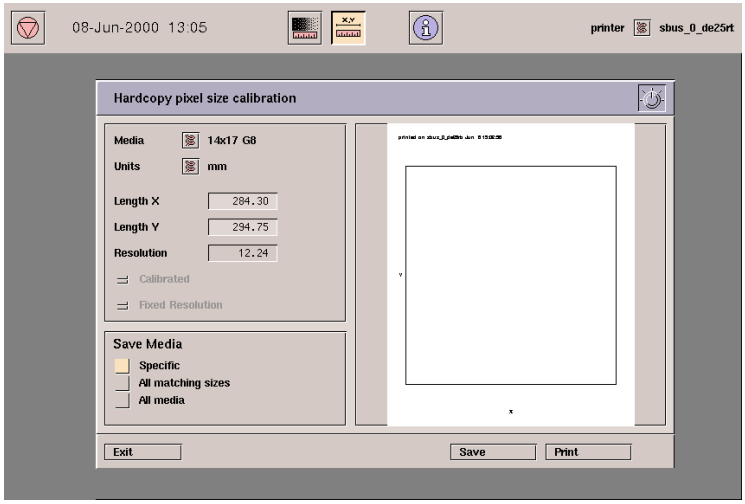

Figure 9: Pixel Size Calibration panel

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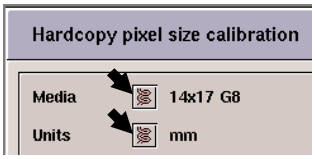
- Click with the left mouse button on Media in the Hardcopy pixel size calibration panel until your selected media size appears.
- Click with the right mouse button on the Units selection spiral until your preferred unit of length will be displayed.



- Click on **Print** in the Hardcopy Pixel Size calibration panel. The printing active information box appears and indicates the progress of the print process. When the calibration film has been printed the information box disappears.
- Measure the distances of Length X and Length Y on the film as accurately as possible with a ruler. If X and Y are mismatched, enter the lengths individually in their respective fields. The field resolution displays the number of pixels per unit of length selected.
- Select either **Specific** or **All Matching Sizes** in the Save Media dialog box:

  Specific in which only the selected media will be calibrated; (recommended)

  All Matching Sizes in which all media of the same size on the selected printer will be calibrated.

NOTE

The selection Specific may be repeated for other supported media.

- Click on Save in the Hardcopy pixel size calibration panel.
- Click on Exit to terminate the Hard Copy Pixel Size calibration.
- Click on the icon Exit to terminate the Hard Copy calibration.

6.4. CHECKING THE RESULTS

- Select the printer you want to check
- click on the information icon on the top icon bar to check the results and the status of the calibration

The Printer information status panel will be displayed:

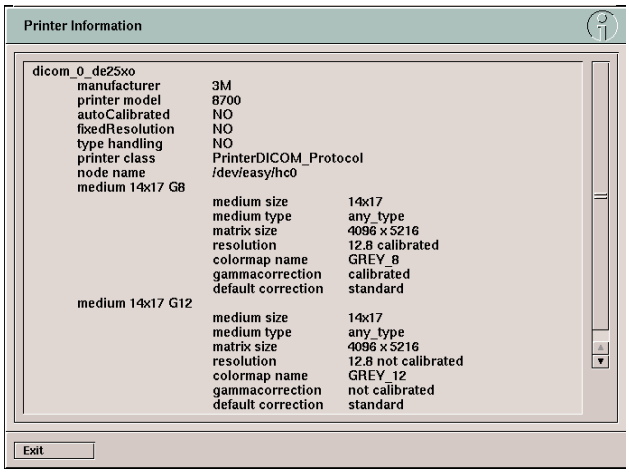


Figure 10: Printer information panel

This panel supplies information about which media are calibrated (both density and pixel) on the selected printer plus additional information. (refer to Figure 10)

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7. BACKUP & RESTORE

7.1. VIA SERIAL PORT

Tools needed: Service PC + null modem cable.
Communication software (e.g. Kermit).

You need your Service PC to make a back-up of the **EasyVision Release Configuration file** and to duplicate this configuration file on each EasyVision .
The PC can be used the same way to make a back-up of the 'Customize' and 'HardCopy Calibration' files.

With every EasyVision RAD the '**Kermit**' communication software will be delivered on a 3.5" (720KB) floppy. The procedure on how to up and download files using 'Kermit' is described in the Release Bulletin (Appendix A). Feel free to use your own communication package (e.g. ProcommPlus) for up and downloading files. As well as 'Kermit', EasyVision also supports X-Modem, Y-Modem and Z-Modem communication protocols.

7.2. VIA FLOPPY DRIVE

It is possible to use the UltraSparcs (Ultra5/10) floppy drive to backup/restore the necessary files. Refer to Section Faultfinding, chapter "File Transfer", or refer to the Release Bulletin.

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8. EASYVISION RAD / HCU CALIBRATION FORM

EasyVision Calibration Form											
Printer Model :							**Format:**				
EasyVision Calibration											
	Upper Left	**Upper Right**	**Lower Left**	**Lower Right**	**Average**	**Target Density**	**Deviation in o. D.**	**Dev. in [%]**	**Lower error limit**	**Upper error limit**	**Calibration necessary**
1.											
2.											
3.											
4.											
5.											
6.											
7.											
8.											
9.											
10.											
11.											
12.											
13.											
14.											
15.											
16.											

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Calibration Verification											
	Upper Left	Upper Right	Lower Left	Lower Right	Average	Target Density	Deviation in o. D.	Dev. in [%]	Lower error limit	Upper error limit	Calibration successfull
1.											
2.											
3.											
4.											
5.											
6.											
7.											
8.											
9.											
10.											
11.											
12.											
13.											
14.											
15.											
16.											
	Date:				System:						
	Time:				Operator:						

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